Rock Products of Utah, Inc.
843 South Main Street
Heber City, Utah 84032

M/043/017

August 17, 2000

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Ref: State of Utah, Dept of Natural Resources, Div of Oil, Gas & Mining Ltr of October 12, 1999

As directed in the reference, ***Rock Products of Utah, Inc.*** (hereafter referred to as Rock Products) is herewith submitting a "Notice of Intention to Commence Large Mining Operations." Form MR-LMO is enclosed.

Rock Products is a small business operation with an office and retail yard located in Heber City, Wasatch County and a mine/quarry site located in Brown's Canyon, Summit County. Since 1995, ***Rock Products*** has mined quartzite Flagstone for retail sales to landscapers, contractors and the general public, as a Small Mine Operation, in compliance with federal, state and local guidelines. It is our intent that ***Rock Products*** will remain a small business operation and that we will mine our same products at about the average rate that we did in the calendar year 1999, which was approximately 4,000 short tons.

Over the next ten years of operation, we would anticipate disturbing up to five (5) additional acres of land and we would anticipate reclaiming approximately that same amount of acreage, as we progress. Since this is our initial effort at an operation and reclamation plan, we would expect that we will have to modify our plan in the ensuing years and we will work closely with the State Department of Natural Resources and Summit County to ensure we meet all requirements.

Please contact me at any time as consideration of this application proceeds.

Respectfully,

Develon G. Wurth
President
Rock Products of Utah, Inc.

Encl: Form MR-LMO "Notice of Intention to Commence Large Mining Operations"

Form MR-LMO

FOR DIVISION USE ONLY
Date Received: M043/017
DOGM Lead: LmK

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

I. Rule R647-4-104 - Operator(s), Surface and Mineral Owners

1. **Mine Name:** **Brown's Canyon Rock Quarry, (T01SR05ESLM)**

2. **Name of Applicant or Company:** **Rock Products of Utah, Inc**

3. **Permanent Address:** **843 S. Main Street, Heber City, Utah 84032**
   Phone: (435) 654-3978

4. **Company Representative** (or designated operator):

   Name: Develon G. Wurth
   Title: President/CEO
   Address: 843 S. Main Street, Heber City, Utah 84032
   Phone: (435) 654-3978

5. **Location of Operation**:

   County(ies): Summit County, UT
   NE 1/4 of SE 1/4 , Section: 20 Township: T.1S Range: 5E

6. **Ownership of Land Surface**: Private (Fee)

   Name: Ken Thayne **Address**: c/o Century 21, 8221 S. 700 E., Sandy, UT 84070

7. **Owner(s) of record of the minerals to be mined**:

   Name: Develon Wurth **Address**: 843 S. Main Street, Heber City, UT 84032

8. **Have the above owners been notified in writing?** Yes

9. **Does the operator have legal right to enter and conduct mining operations on the land covered by this notice?** Yes

II. Rule R647-4-105 - Maps, Drawings & Photographs

105.1 - Base Map

(Map Ref: PARK CITY EAST QUADRANGLE, UTAH, 7.5 MINUTE SERIES (TOPO)

Base Map Checklist — Map ID

(Base map scale not less than 1" = 2000'.)

(a) Property boundaries of surface ownership of all lands which are to be affected by the mining operations: — Exhibit A, Exhibit B

Exhibit A is the Base Map, referenced above, and shows the property boundaries leased by Rock Products, as provided in the lease from the owner of the land. (Scale of Exhibit A is 1" = 2000')

Exhibit B is an enlargement of the Base Map and show a more detailed view of the boundaries. Scale of Exhibit B is 1" = 1000'.

(b) Perennial, intermittent, or ephemeral streams, springs and other bodies of water; roads, buildings, landing strips, electrical transmission lines, water wells, oil and gas pipelines, existing wells or bore-holes, or other existing surface or subsurface facilities within 500 feet of the proposed mining operations: — Exhibit B

Exhibit B shows several structures not indicated on the Base map. There are three temporary structures - two mobile trailers and an explosives storage container. These are removable. There are two gates, both lockable, that block motor vehicle entrance into the mining/quarry area from the hard surface road. A power line has been added by the power company that crosses the Southern part of the property, parallel to the hard surface road. A fence has been constructed by the company that has the grazing rights to the property and this fence basically borders the hard surface road on the south and west and ties in the two access gates. There are also several sites, from previous mining operations, that are noted on Exhibit B. These sites, and access roads to them, have never been and are not now part of the current Rock Products mining operation. The streams to the east and west of the mining/quarry site have water in them during runoff in the spring and rains in the early summer. They are well outside the current mining location. The only standing water is in the pond in the far southeast corner and the stream that crosses the far northeast corner of the property. This pond and the stream are not disturbed by our mining operation.

(c) Proposed route of access to the mining operations from the nearest publicly maintained highway (map scale appropriate to show access): — Exhibit B

Gated access roads are noted on Exhibit B in brown. The road in green that appears to be linked to the hard surface road is fenced off from the hard surface road and there is no access from inside the fenceline. The initial

50 feet of the east access road is paved and is shared with the property owner to the east of Rock Products.

(d) Known areas which have been previously impacted by mining or exploration activities within the proposed land affected: Exhibit B

Several exploration pits/sites from previous mining operation are noted on Exhibit B. Over the next ten years of mining operations, it is expected that Rock Products may do some mining in the vicinity of the previously disturbed area that is noted in the northeastern portion of the quarry. Access roads to the previously impacted areas have been left to regenerate themselves and are blocked off to normal traffic. These roads now only exist for possible emergencies and for maintenance on the power lines by the power company. A very vague, unimproved road follows directly under the power line and is used by the power company when maintaining or inspecting the power lines.

(e) Areas proposed to be disturbed or reclaimed over the life of the project or other suitable time period: Exhibit C

It is our intent to disturb as little acreage as necessary during the next ten year period, and to reclaim as we proceed. Exhibit C is our best estimate of the areas "proposed" for disturbance and reclamation. Our current focus of efforts, for at least the next 2-3 years, will remain in the eastern portions, as shown in the Exhibit C. The western portions will be explored and/or mined in a manner which will cause the least disturbance.

105.2 - Surface Facilities Map

Surface Facilities Map Checklist Map ID

(Surface facilities map scale not less than 1" = 500'.)

(a) Proposed surface facilities, including but not limited to: buildings, stationary mining/processing equipment, roads, utilities, power lines, proposed drainage control structures, and location of topsoil storage areas, overburden/waste dumps, tailings or processed waste facilities, disposal areas for overburden, solid and liquid wastes, and wastewater discharge treatment and containment facilities: Exhibit D

The following can be found in Exhibit D:

- Buildings. There are two temporary (removable) trailers and one removable explosive storage container. These are indicated in black rectangles.

- Roads. As best can be predicted, roads are indicated in brown on the map. Existing roads will be used to the maximum extent.

- Power-lines. There is one power-line, in the southern portion of the quarry, that parallels the hard surface road.

- Topsoil Storage Area. Soil is very sparse in the quarry area. Available soil will be stockpiled for reclamation. There may be a requirement to establish a borrow pit in an area with more soil. Proposed topsoil storage sites are indicated in purple.

- Rock Overburden/Waste Dump Sites. Overburden/waste dump sites are indicated in orange.

- The following facilities are not planned to be part of this mining operation: stationary mining/processing equipment; utilities; drainage control structures; waste facilities for solid and/or liquid waste; and wastewater discharge treatment and containment facilities.

(b) A border clearly outlining the extent of the surface area proposed to be affected by mining operations, and the number of acres proposed to be affected: Exhibit D

The proposed surface area to be affected by our long mining intent is indicated on Exhibit D, and includes all roads, mining, storage and operating areas. It will be approximately 10 total acres.

(c) The location of known test boring, pits, or core holes. Exhibit D

There are no known existing nor projected test boring pits or core holes.

105.3 - Additional Maps

Reclamation Treatments Map Checklist Map ID

(Reclamation Map Scale 1" = 250'.)

(a) Areas of the site to receive various reclamation treatments shaded, cross hatched or color coded to identify which reclamation treatments will be applied. In general, reclamation will consist of putting waste rock and subsoil back into the quarried out portions as the quarry face recedes to the west. This will be followed by contouring and smoothing of affected areas with a dozer and re-spreading topsoil (when available), and/or composted manure. Areas will be seeded with approved seed mixtures. Final reclamation will consist of re-grading all disturbed areas not previously reclaimed, and applying topsoil or composted manure, and seeding. Areas include: Exhibit E

(1) Buildings. Temporary buildings/structures include two trailers and an explosive storage container. These will be removed from the quarry and the areas will be re-graded and ripped, as necessary, then seeded. These areas are marked in black cross hatch on Exhibit E.

(2) Roads. All roads will be re-graded, fertilized and broadcast seeded. Roads that are devoid of any top soil will be covered with a mixture of soil and manure and overburden. This will then be graded and seeded. These areas are marked in brown on Exhibit E.

(3) Topsoil Storage Areas. Topsoil will be removed from the storage areas for various reclamation uses. The storage area will be graded, fertilized and seeded. These areas are marked in purple on Exhibit E.

(4) Overburden/Waste Dumps. Overburden that remains after use in other areas of the quarry to augment reclamation will be mixed with manure and the overburden site will be smoothed and seeded. These areas are marked in orange on Exhibit E.

(5) General Mine Operating Areas. These areas are those that will remain after mining operations cease, not included as roads, storage areas or overburden/waste sites. These areas also include the less than 3 horiz.: 1 vert. and 45 degree slopes. These areas will be ripped (where feasible) graded, covered with a mixture of top soil, manure and overburden, and seeded. These areas are marked in yellow with cross hatches on Exhibit E.

(6) Trash/waste. Any trash or limited waste materials will be kept in metal receptacles and periodically taken to the appropriate dump/landfill site.

(7) Public Safety and Welfare. The quarry and mining sites are private property and it is not expected that it will become public after mining ceases, thus limiting public access. Currently, a barbed wire fence surrounds the property on three sides. Only the northern portions of the leased property are not fenced. There are two access roads from the hard surface road to the south and both of these roads are gated. The eastern gate is open for daily traffic and is locked after hours (usually 7:00 PM to 7:00 AM) and on Sundays. Danger/warning and no trespassing signs are posted along the power lines facing the hard surface road and on both access gates. If high walls remain after mining operations have ceased and reclamation is complete, then warning signs will be posted around the high wall with the appropriate hazards identified. During deer hunting season, permission to enter and hunt must be obtained in writing from the owner of Rock Products, which serves to ensure those hunting on the property know the dangers of the mining operation.

(b) A border clearly outlining the extent of the area to be reclaimed after mining, the number of acres disturbed, and the number of acres proposed for reclamation: Exhibit E

The border outlining the areas to be reclaimed is as shown in Exhibit E.

(c) Areas disturbed by this operation which are included in a request for a variance from the reclamation standards: Exhibit E

At this time, it is not known whether there are any areas that will require variance. The most likely variance request may be for the thickness of reclamation soils. Most places in the current mining site have no more than 2"or 3" of soil over the rock.

(d) Highwalls which are proposed to remain steeper than 45 degrees and slopes which are proposed to remain steeper than 3 horizontal : 1 vertical. Exhibit E

At this time, it is not anticipated that we will leave any highwalls. We will attempt to grade slopes to less than the 3 horizontal: 1 vertical.

III. Rule R647-4-106 - Operation Plan

106.1 - Mineral(s) to be mined: Quartzite Flagstone

106.2 - Type of Operation Conducted: Rock is mined by the following methods and procedures, which will assume a start to finish process:

1. **Blasting**. A tracked air drill, powered by an air compressor, is used to bore holes in the "face" of the rock wall (10' -15' deep) or in other locations requiring loosening of the rock. An average size blast requires about 20-25 bore holes. The bore holes are then packed with a stick of dynamite (usually Ireco Gel, 1 ½" x 16") that is primed with explosive detonation cord (usually CordTex). Each hole is then filled with an explosive enhancement material (usually AMEX Bagged ANFO). The hole is sealed with dirt to encase the explosion. All detonation cord is linked together in succession and attached to a primer cord and blasting cap, which is further attached to a fuse. For safety purposes, we currently use a lighted fuse. All personnel and equipment move to cover, personnel in the adjacent quarry are advised of the immanent blast, access roads are closed and personnel are stationed where they can monitor access into the blast area. The blast is set off set off when the owner (who does all blasting) has assured himself that no one is within the blast radius.

2. **Digging**. Post-blast, a tracked excavator (track hoe) is used to pull "loose" rock from the blast area into piles of various sizes. In this small mining operation, there are some boulders that are too large for moving into piles. These are normally split in place by use of another tracked excavator with a large hydraulic hammer device attached. These pieces are then moved, as above.

3. **Loading**. Bulk rock (usually 2' - 6' boulders or larger slabs, rock that is normally flat and from 3' x 3' x 6" up to 10' x 16' x 24") are then loaded into dump trucks and hauled away as delivery orders, or they may be hauled to another location for splitting into 1" - 5" thick patio/wall stone.

4. **Stockpiling**. Rock is also stockpiled at the quarry according to its product use, by size and color. Boulders and slabs, are stockpiled near the quarry fringes and are selected, as required, for orders. Some smaller boulders (6" - 18") are also stockpiled in bermed dirt bins on the quarry fringes. Usually, a small amount of split rock is stockpiled at the quarry on the upper levels, but most "splitting" rock is taken to the yard in Heber for splitting and palletizing. No palletizing is done at the quarry.

5. **Clearing**. Smaller rock (usually under 1') and other debris (very small pieces of rock and dirt mix) is picked up by a track loader (D77) and moved to the outer fringes of the digging site as overburden. Waste dirt, or dirt that we determine can be re-utilized for future reclamation, is moved to a specific locations on the outer fringes of the quarry access road and stockpiled.

6. **Concurrent Reclamation**. Areas disturbed are now smoothed over and cleared of as much debris as feasible. Our future intent is to use some waste dirt available to smooth and contour those areas that we will not expect to disturb in further operations and are candidate areas for reclamation. We would prefer to leave un-seeded until we have a minimum of an acre that we have reclaimed. In other words, as we continue operations, our intent will be that reclamation is continuous.

106.3 - Estimated Acreage

(Acreage listed here should match areas measured off the maps provided)

	Current Operation	10 Year Proposal
Areas of actual mining:	1.5 Acres	4.5 Acres
Overburden/waste dumps:	1.0 Acres	1.5 Acres
Ore and product stockpiles:	1.5 Acres	1.5 Acres
Access/haul roads:	1.0 Acres	1.5 Acres
Associated on-site preparation facilities:	0 Acres	1.0 Acres
Tailings disposal:	0 Acres	0 Acres
Other - Please describe:	0 Acres	0 Acres
Total Acreage	5.0 Acres	10.0 Acres

106.4 - Nature of material including waste rock/overburden and estimated tonnage

(a) Describe the typical annual amount of the ore and waste rock/overburden generated, in cubic yard.

Ore	4,000	Short Tons
Waste/Overburden	500	Short Tons

(b) Where does the waste material originate?

Waste is a combination of soil from pockets in the rock and small pieces of rock that break up during blasting and mining operations.

(c) What is the nature of the overburden/wastes (general chemistry/mineralogy and description of geologic origin)? Gravely, cobbly loam.

(d) Will it be in the form of fine or coarse material?
Course.

(e) What are the typical particle sizes and size fractions of the waste rock?

Thickness of overburden:	1"-6" Inches
Thickness of mineral deposit:	N/A tons
Estimated annual volume of overburden:	500 tons
Estimated annual volume of trailings/reject materials:	N/A tons
Estimated annual volume of ore mined:	4,000 tons

Overburden/waste description:

- Small, course rock mixed with dirt.

106.5 - Existing soil types, location of plant growth material

Provide specific descriptions of the existing soil resources found in the area. Soil types should be identified along with depth and extent, especially those to be directly impacted by mining.

Soils. The plan shall include an order 3 Soil Survey (or similar) and map. This information is needed to determine which soils are suitable for stockpiling for revegetation. This soil data may be available from the local Soil Conservation Service office, or if on public lands, from the land management agency. The map needs to be of such scale that soil types can be accurately determined on the ground.

(a) Each soil type to be disturbed needs to be field analyzed for the following:

Depth of soil material	10-12 inches
Volume (for stockpiling)	6,742-8,062 cu yds
Texture (field determination)	cobbly loam
pH (field determination)	6.5 undisturbed
(cross ref with item 106.6)	8.0 overburden

(b) Where there are problem soil areas (as determined from the field examination) laboratory analysis may be necessary. Soil samples to be sent to the laboratory for analysis need to be about one quart in size, properly labeled and in plastic bags. Each of the soil horizons on some sites may need to be sampled. Soil sample locations need to be shown on the soils map. Soil analysis for these samples should include: texture, pH, Ec (conductivity), CEC (Catoin Exchange Capacity), SAR, % Organic Matter, Total N, Available Phosphorus (as P2O5), Potassium (as K2O), and acid/base potential. See Exhibit F for details.

106.6 - Plan for protecting and re-depositing existing soils

Thickness of soil material to be salvaged and stockpiled:	10-12 inches
Area from which soil material can be salvaged (show on map):	4.9 acres
Volume of soil to be stockpiled: (cross reference with item 106.5 (a))	6588-7900 cu yds

Describe how topsoil or subsoil material will be removed, stockpiled and protected.

Topsoil will be gathered with a track loader and stockpiled in a bin surrounded by a berm to prevent run off of soils during inclement weather. Two locations are indicated on Exhibit E.

106.7 - Existing vegetative communities to establish revegetation success

Vegetation - The operator is required to return the land to a useful condition and **reestablish at least 70 percent of the pre-mining vegetation ground cover.**

Provide the Division with a description of the plant communities growing onsite and the percent vegetation cover for each plant community located on the site. Describe the methodology used to obtain these values.

The percent ground cover is determined by sampling the vegetation type(s) on the areas to be mined (see Attachment 1 for suggested sampling methods).

(a) Vegetation Survey - The following information needs to be completed based upon the vegetation survey:

Sampling method	Transect - Nested Plot
Number of plots or transects (Min 10)	3 Transects - 10 Plots each, total 30 Plots

Ground Cover	Percent
Vegetation (perennial grass, forb and shrub cover)	30
Litter	45
Rock/rock fragments	23
Bare ground	2
	100%
Revegetation requirement (70% of above vegetation figure)	21%

List the predominant perennial species of vegetation growing in each vegetation community type.

Querus Gambelli (Gammel Oak)
Galium Aparine (Bed Straw)
Poa Pratensis (Bluegrass)
Hahonia Repens)Oregon Grape
Elymus Spicata (Wheatgrass)

(See Exhibit F for details.)

(b) Photographs - The operator may submit photographs (prints) of the site to show **existing vegetation conditions. These photographs should show the general appearance** and condition of the area to be affected and may be utilized for comparison upon reclamation of the site. Photographs should be clearly marked as to the location, orientation and the date they were taken. (See Exhibit F for details.)

106.8 - Depth to groundwater, overburden material and geologic setting

Describe the approximate depth to groundwater in the vicinity of the operation based on the completion of any monitoring or water wells in the area. Please show the location of these well on the base mat.

Depth to groundwater N/A ft.

Provide a narrative description of the geology of the area and/or a geologic cross section.

(See Exhibit F for details.)

106.9 - Location and size of ore and waste stockpiles, tailings and treatment ponds, and discharges

(a) Waste Rock/Overburden Stockpiles. The current and proposed overburden/waste stockpile areas are shown in Exhibit E. Total area is estimated to be about 1,000 sq.ft.

(b) Removal/Stockpile of Overburden. Overburden is dug from the mining site by a tracked excavator and separated from the useable boulders/rock. It is then moved by a track loader to the overburden/waste storage location for stockpiling.

(c) Waste Rock. Our waste rock is combined with overburden, a mixture of soil and small rocks (not feasible for sale). It is stockpiled and will be used for filling holes, mixing with composted manure and spreading for cover.

(d) Other. We do not anticipate tailing facilities, water storage or treatment ponds. Therefore, we have not considered requirements for effluent discharge points (UPDES) and/or the need for any type of water quality analyses or chemical analyses.

IV. Rule R647-4-107 - Operation Practices

(a) Measures taken to minimize hazards to public safety during mining operations:

(1) Closing or guarding shafts and tunnels - We do not make shafts or tunnels in this type of mining operation, therefore this is not applicable.

(2) Disposal of trash, scrap metal, wood or extraneous debris - This material is collected in metal containers and hauled to the appropriate county dump site.

(3) Plugging or capping of drill, core or other exploratory holes - On the occasion that we would dig an exploratory pit or hole that may not be used, we would back fill this pit with a mixture of waste rock, overburden, soil and composted manure and smooth over for seeding. In this manner, we would lessen a possibility of a person accidentally stumbling into the pit.

(4) Posting of appropriate warning signs in locations of public access to operations - Signs indicating mining/quarry operations are in progress are posted at both entrances. The eastern most entrance from the hard surface road is the only "public access" during operating hours (7:00 AM to 7:00 PM, Monday through Saturday). The gate is closed and locked during non-operating hours and on Sundays. The western access gate to the hard surface road is only for Rock Products personnel. Also, no trespassing signs are posted along the fenceline that borders the hard surface road to the south of the quarry.

(5) Construction of berms, fences or barriers above highwalls or other excavations - Berms and/or a boulder barrier separate immediate access to the top of the highwall where mining operations take place. Caution signs are posted at the approaches to the highwall drop-off. A berm has been placed around all operating areas, as required by MSHA.

(b) Environmental and erosion measures within mining operations areas:

(1) Measures taken to avoid or minimize environmental damages to natural drainage channels - Mining is not conducted in channels, stream beds or drainage. They are left to flow naturally.

(2) Measures taken to control and minimize sediment and erosion on areas affected - Most areas currently being mined are virtually devoid of sediment. The largest amounts of "sediment" are in the loading and maneuver areas at the bottom of the high wall. Operations normally must cease during heavy rains or snow, due to the slick conditions and we do not operate from December through March, when the heaviest and most severe weather occurs, decreasing the possibility of erosion caused by equipment.

(3) Measures being taken to prevent sediment from leaving disturbed area - Berms of rock dirt and overburden are located around the operating areas.

(4) Potentially deleterious materials that may be stored on site.

- Fuel, oil and grease for equipment is hauled in, as needed, in a service vehicle. No fuel, oil or grease is stored on the quarry site.

- Dynamite, det-cord and granulated explosive chemicals (ammonium nitrate) are stored in a waterproof, locked, commercial container that is partially buried. We keep no more than 500 lbs. On site at any one time, usually just before blasting operations. These chemicals are not in contact with soils except when used for blasting in the mining operation. Residue from blasting is virtually non-existent.

(5) Measures taken to salvage and store soils to be used in reclamation - attempts will be made to salvage all soil, no matter how sparse. When moving into a new area for exploration and eventual mining, the soil will be scraped off the rock and transported to one of the topsoil storage areas. Often soil will be interspersed in the excavated rock. This soil/rock is placed in the overburden pile for eventual re-use in reclamation.

(6) Protection of stockpiled topsoil - the topsoil will be in a "lowered" or dug out location so erosion from rain, wind, snow and any other elements will be minimal.

(7) Reclamation to be done during active mining operations prior to final closure - it is anticipated that we will fill exploratory holes/pits as we dig them and decide we will not use them. Roads that are not used will be reclaimed as long as they are not necessary for emergency access or use. We will also anticipate holding off on any larger reclamation efforts until we have about an acre of land to reclaim.

V. Rule R647-108 - Hole Plugging Requirements

Since this operation does not intend to drill holes, we feel this portion is not applicable to our operation. The only holes that we drill are those for blasting operations and they are only 2"-3" in diameter and are virtually non-existent after blasting.

VI. Rule R647-109 - Impact Statement (Within proposed mining area of operation)

109.1 - Surface and groundwater systems

There is no surface or groundwater systems in the current or proposed mining locations that will be affected.

109.2 - Wildlife habitat and endangered species

(a) Impacts on wildlife habitat - Minimal. Some rabbits, chipmunks and "rock chucks" live in and around the rock and move as the rock moves.

(b) Impacts to big game species - Minimal. Big game, normally deer, pass through the quarry areas.

(c) Impacts to riparian areas - no riparian areas exist in the mining operation areas.

(d) Impacts to waterfowl (flyover, temporary or permanent residence) - none.

(e) Threatened or endangered wildlife species - none.

(f) Measures taken to minimize or mitigate any impacts to wildlife or endangered species - N/A.

109.3 - Existing soil or plant resources

(a) Impacts to existing soil and plant resources - minimal.

(b) Impacts to riparian or wetland areas - none.

(c) Impacts to threatened or endangered plant species - none.

(d) Measures to be taken to minimize or mitigate impacts to soil and plant resources - all new exploration or digs are developed with a sense toward least disturbance to existing soil and plant resources.

109.4 - Slope stability, erosion control, air quality public health and safety

(a) Slope stability - will be stabilized to 2 horizontal:1 vertical minimum.

(b) Erosion - N/A.

(c) Air quality - N/A.

(d) Public health and safety - Accesses are posted with warning/danger notification signs that will remain "post mining."

VII. Rule R647-4-110 - RECLAMATION PLAN

110.1 - Current land use and post-mining land use

Other than current mining operations, the land uses for this area has been cattle grazing and deer hunting. It is anticipated that post-mining, the land uses will continue to be cattle grazing and deer hunting.

110.2 - Reclamation of roads, highwalls, slopes, leach pads dumps, etc.

(a) Road reclamation. Roads will be graded and ripped and then re-seeded. Where necessary, holes and gouges will be filled to the level of the road bed. Final configuration is expected to be grass/oak covered.

(b) Highwall reclamation. It is expected that any highwalls will, eventually be worked to a 3 horizontal:1 vertical (3h:1v) slope. If not, we will blast and re-grade, as necessary, in an attempt to lower the grade to the acceptable 3h:1v. We will then add a mixture of overburden, topsoil and composted manure, which will then be seeded. Final configuration is expected to be grass/oak covered.

(c) Slope Reclamation. We will re-grade those slopes more than 3h:1v configuration, and add a mixture of overburden, topsoil and composted manure, then re-seed. For those slopes that consist mostly of dirt, we will re-grade as necessary and seed. Final configuration is expected to be grass covered.

(d) Waste dumps/overburden. The only waste by-products are rock and soil mixed. This is stockpiled for use in reclamation. Where the dumps remain, will grade to less than 3h:1v, add topsoil and composted manure, as necessary, and re-seed. Final configuration is expected to be grass/oak covered.

(e) Pits. Any pit or exploration hole will be filled with a mixture of overburden, topsoil and composted manure, smoothed and seeded. Final configuration is expected to be grass/oak covered.

(f) Other. We feel the following are not applicable to this mining operation: impoundments; drainage/natural drainage patterns; ponds; shafts; adits; 8 drill holes; and leach pads.

110.3 - Surface facilities to be left - It is not anticipated than any surface facilities will be left after mining operations or reclamation

110.4 - Treatment, location and disposition of deleterious materials - Deleterious material are not present nor used. Trash is collected in metal containers and removed from the site weekly. There will be no trash pit or trash receptacles remaining on the site after mining operations have ceased.

110.5 - Revegetation planting program and topsoil redistribution

(a) Soil Material Replacement

- Volume of soils and approximate depth - Approximately 8,000 CuYds at 6" deep.

- **Sources of soils - Local quarry sources.**

- Agronomic analysis - See Exhibit F (Vegetation and Soil Baseline Report)

- Alternative materials/amendments to be applied in lieu of soils - Addition of composted manure.

- **Methods used to transport and place soils - Use of dozer/loader.**

(b) Seed Bed Preparation

- **Preparation of seed bed and equipment to be used - Use of dozer/loader with** ripping devise, where required. Will be left rough (moon scaped). Area is not expected to be used for recreation.

(c) Seed Mixture - (Species to be Seeded)

Common Name	Name Species	Rate lbs/acre
Thickspike wheatgrass	Agropyron Dasystachum	2.0
Bluebunch Wheatgrass	Agropyron Spicatum	2.0
Intermediate Wheatgrass	Agropyron Intermedium	1.0
"Piute" Orchard Grass	Dactylis Glomerata	0.5
Basin Wildrye	Elymus Cinereus	2.0
Ladac Alfalfa	Medicago Sativa	1.0
Yellow Sweetclover	Melilotus Officinalis	0.5
Rocky Mountain Penstemon	Penstemon Strictus	0.5
Small burnet	Sanguisorba Minor	1.5
Mountain Big Sagebrush	Artemisia Tridentata Vaseyana	0.1
Serviceberry	Amelanchier Alnifolia	1.0
Forage Kochia	Kochia Prostrata	0.5
Bitterbrush	Purshia Tridentata	1.0
	Total	13.6 lbs/acre

(d) Seeding Method

- Broadcast seeding

(e) Fertilization - (Method, type and application rate) - N/A.

(f) Other Revegetation Procedures - N/A.

VIII. Rule R647-4-112 VARIANCE - No variance requests anticipated.

IX. Rule R647-4-113 SURETY

(Table constructed using Utah State Div. of Oil, Gas and Mines Estimate spreadsheet sample and data.)

Task	Quantity/Units	Cost/Unit	Cost/Task
Signs, Safety Gates	2 Signs	$200/Sign	$400
Equipment Removal - 2 Trailers - 1 Explosive Contr. - 1 Air Compressor	4 Pieces Equipment	$48/Trip	$192
Debris Removal	6 Hours	$15/Hour	$90
Regrading Facilities Areas	1 Acre	$337/Acre	$337
Regrade Waste Dump Slopes	4,000 Cubic Yards	$.33/CuYd	$1,320
Rip Waste Dump Tops	.5 Acre	$250/Acre	$125
Rip Stockpile and Compacted Areas	2 Acres	$250/Acre	$500
Rip Pit Floors	2 Acres	$250/Acre	$500
Rip Pit Access Roads	.5 Acre	$250/Acre	$125
Create Safety Berms	3,000 Linear Feet	$.11/LF	$330
Rip Quarry Access Roads	1.5 Acres	$250/Acre	$375
Regrade Quarry Access Roads	1.5 Acres	$337/Acre	$500
Sidecast Material Replacement on Steep Roads	800 Linear Feet	$.85/LF	$680
Surface Drainage Restoration or Construction	400 Linear Feet	$.11/LF	$44
Topsoil Replacement	8,000 Cubic Yards	$.33/CY	$2,640
Composted Manure Addition	8 Acres	$300/Acre	$2,400
Broadcast Seeding	8 Acres	$170/Acre	$1,360
Trash Removal and Site Cleanup	8 Acres	$50/Acre	$400
Equipment Mobilization	2 Pieces	$1,000/Piece	$2,000
		Sub-Total	**$14,318**
10% Contingency			$1,432
		Sub-Total	**$15,750**
Escalate 5 years @ 3.13% per Year		**Total**	**$18,372**

X. SIGNATURE REQUIREMENT

I hereby certify that the foregoing is true and correct.

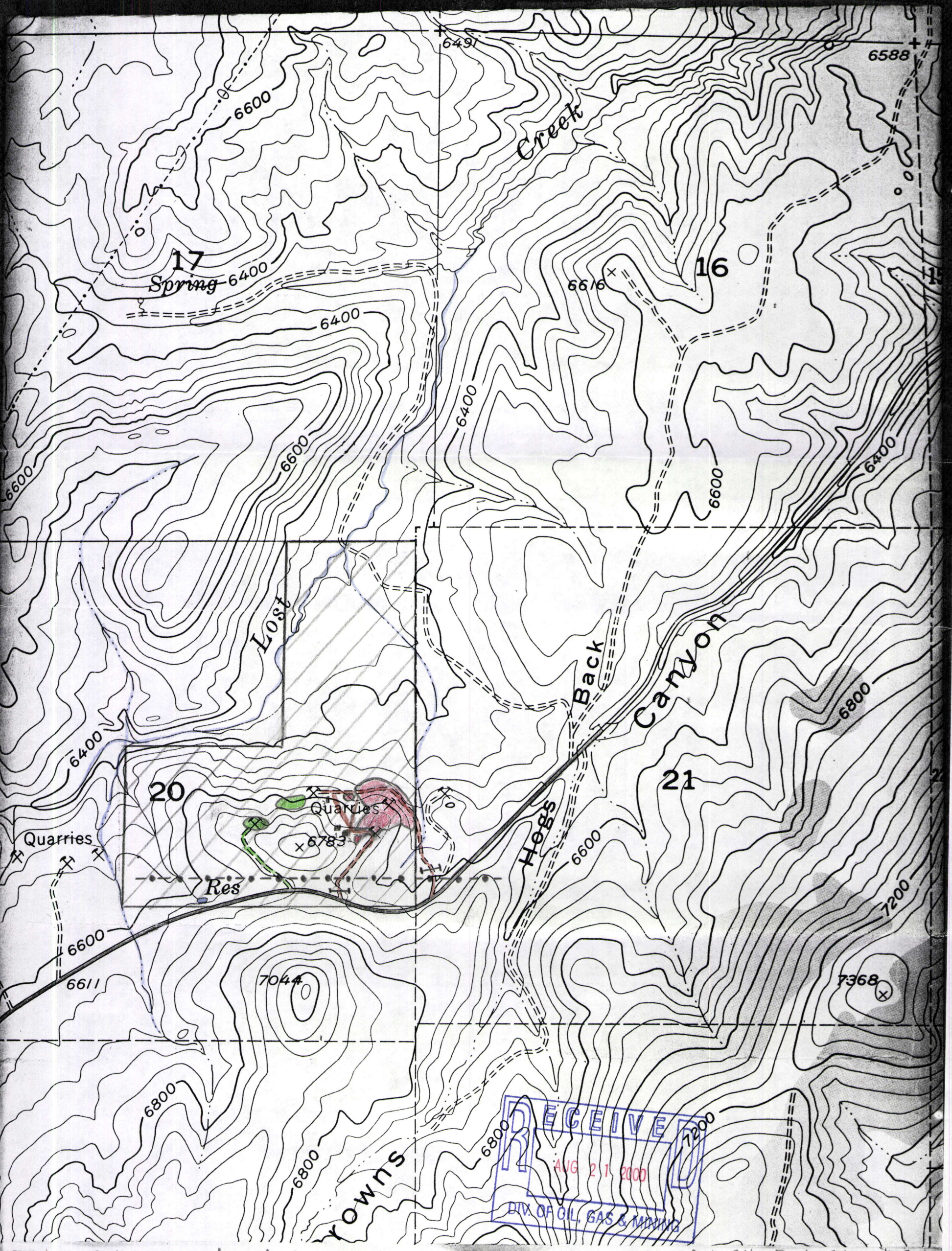
Signature of Operator/Applicant: 

Name (Typed or Printed): Develon G. Wurth

Title/Position: **President/Owner**

Date: 8/18/08

Confidential Information Enclosed: (X) Yes (x) No



Rock Products Leased Land (@ 154 acres)

Previous Mining Ops

Mining Operation / Disturbed Sites (@ 4.3 Acres)

Roads, Dirt Improved (@ .5 Acres)

Water / Streams

Power Line

Gate (2)

Temporary structures (3)

1

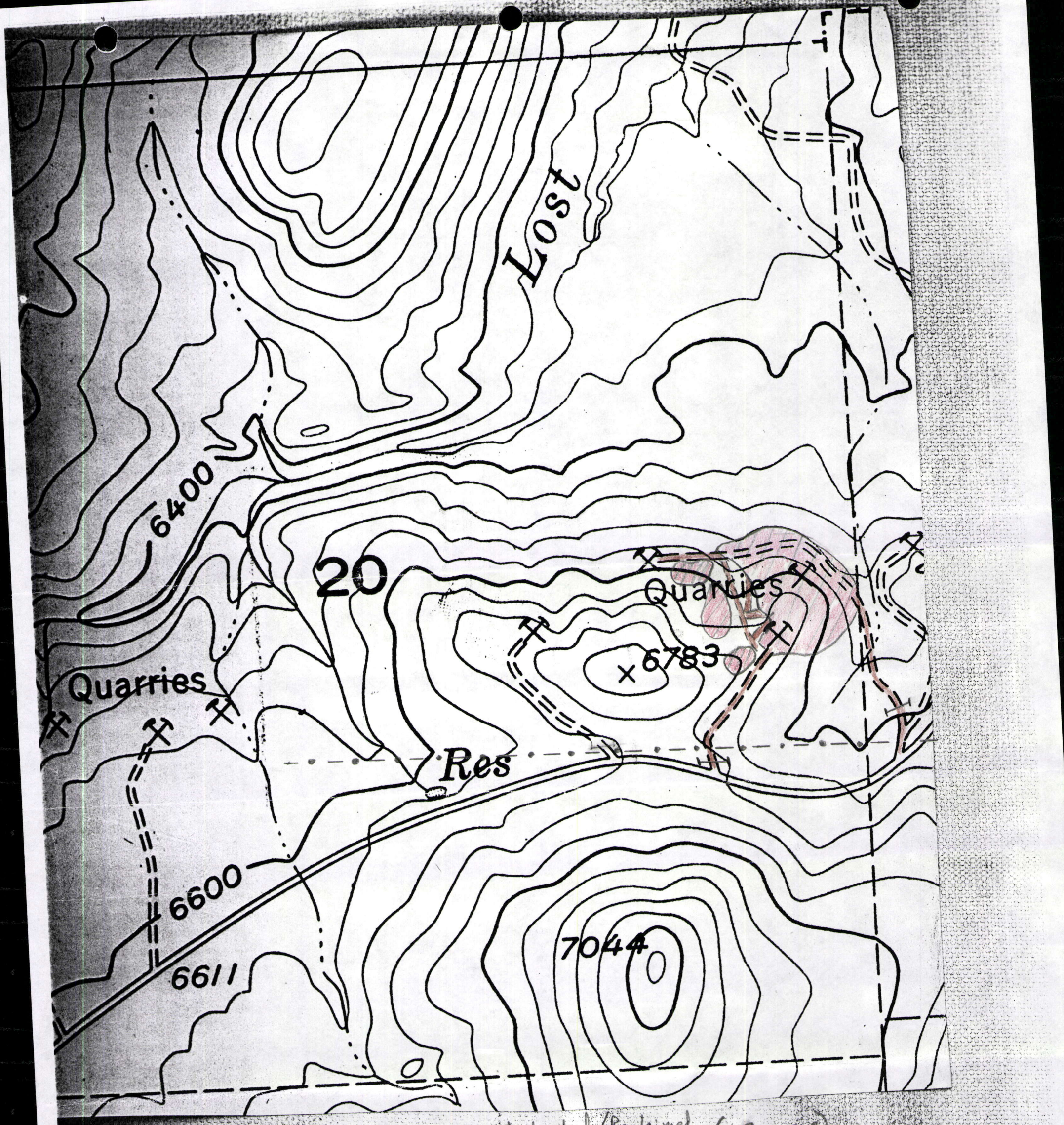
map: Park City East 7.5 minute Series

DMA 3765 III NW – SERIES V897

scale 1" = 1000'

Contour Interval = 40'

Exhibit B



Acreage to be disturbed / Reclaimed for mining Operations (@ 9 acres)

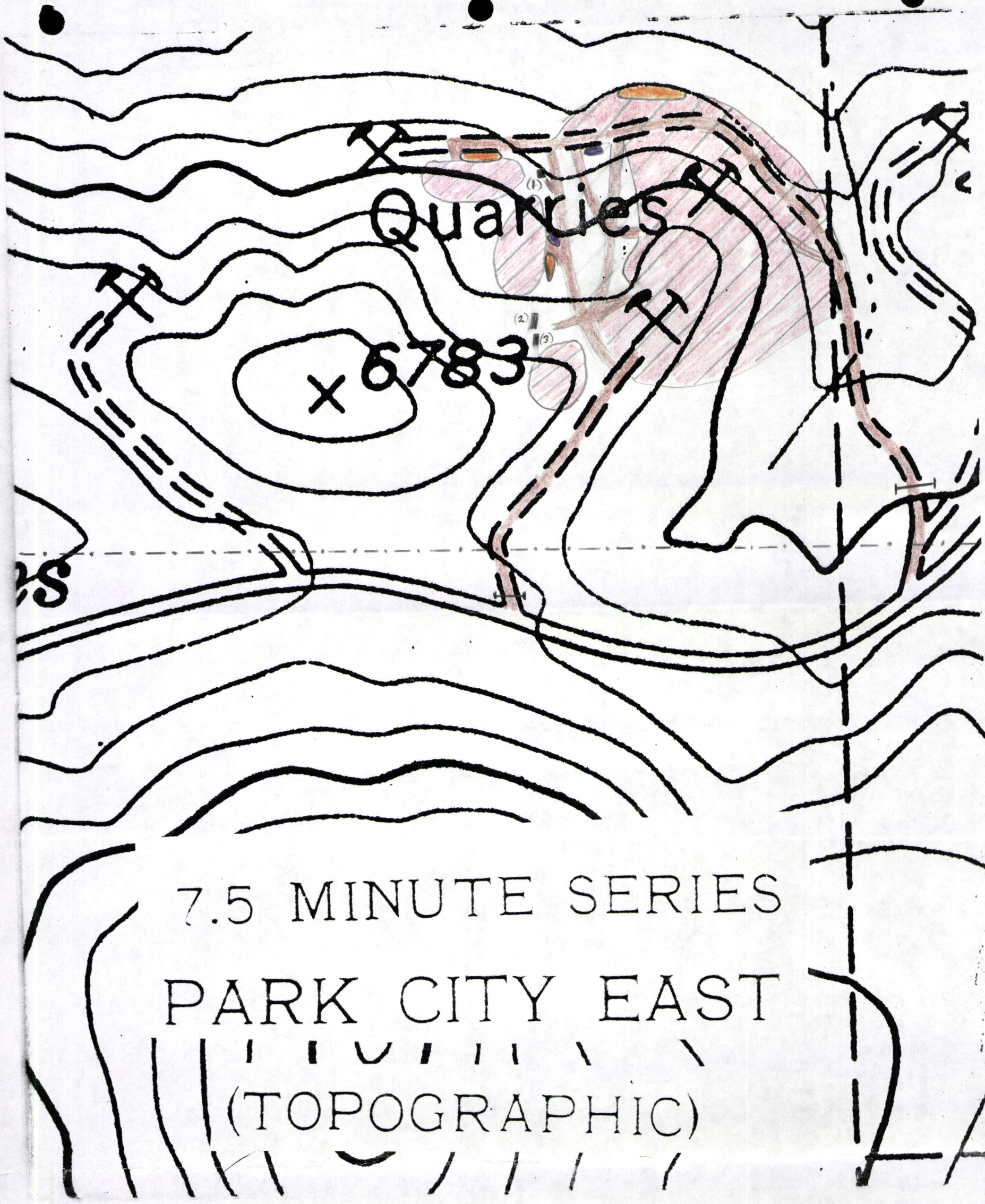
Access Roads (@ 1 acre)

Power Line

Access Gate

Exhibit C

Scale 1" = 500'



Roads

Proposed Mining Areas

Topsoil Storage

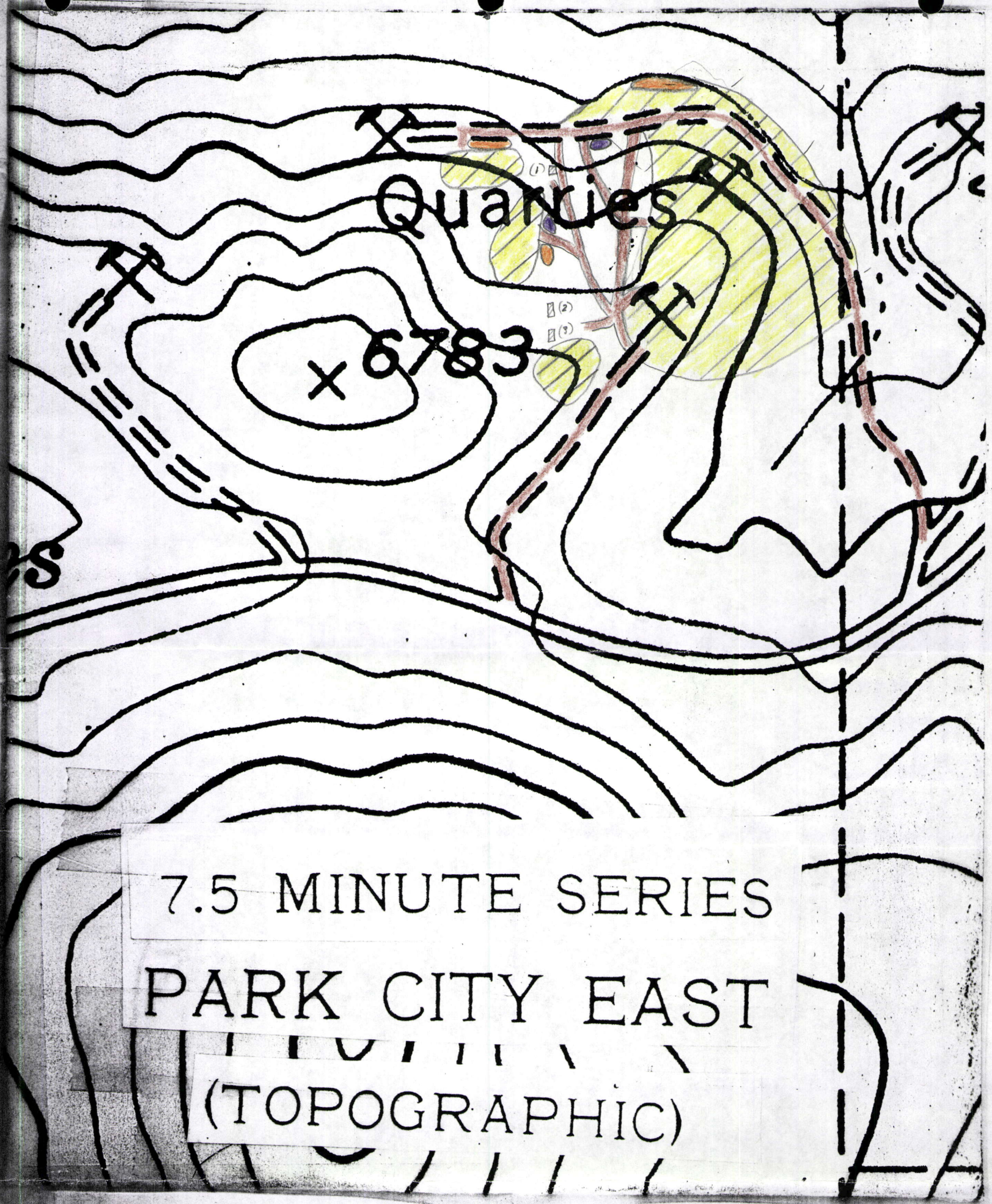
Over burden / Waste Dumps

Powerlines

Gates

(3) Non-Permanent structures

Exhibit D Scale 1" = 250'



Roads

General Mine Opns.

Topsoil Storage Areas

Overburden/Waste Dumps

(1) Structure Locations

Exhibit E Scale 1" = 250'

Exhibit F

ROCK PRODUCTS OF UTAH
VEGETATION AND SOIL BASELINE REPORT

Prepared for

Rock Products of Utah
843 South Main Street
Heber, UT 84032

Prepared by

Western Wetland Systems
1625 Palomino Circle
Heber, UT 84032

June 2000

INTRODUCTION

Rock Products of Utah is applying for an expansion of its existing quarry in Peoia, Summit County, Utah. The mine will be gradually expanded from is current 5 acre size to 10 acres. The expansion is expected to occur over a period of up to 10 years. The purpose of this report is to provide a baseline characterization of soils and vegetation according to the requirements of the Utah Oil, Gas and Mining Division requirements as listed on Form MR-LMO.

METHODS

The draft NRCS soil data for Summit County (NRCS 2000) was reviewed and soils examined in the field to verify the upper soil profile data. Soils were examined in three locations: in two undisturbed gambel oak stands and at a location in which current quarry activities had left a vertical cut exposing the entire soil profile to bedrock. Soils were characterized by horizon, depth of horizon, texture, color (chroma and hue), and pH of the topsoil or A horizon. Soil pH was measured in the field using a Lamotte Chemical colorimetric test.

Two upper profile (topsoil) soil samples were collected and sent to the Utah State University (USU) laboratory for chemical analysis. Soils were collected from undisturbed vegetation in the area identified for mine expansion and in existing stockpiled overburden. Sample locations in relation to the NRCS soil survey are shown on Figure 1. Soil samples were collected on April 12, 2000 and sent to the USU lab on the same day. Cobbles too large to fit in the sample container were excluded from the material sent to the lab.

The volume of topsoil available for site reclamation in the undisturbed vegetation was estimated by multiplying the minimum depth of topsoil times the area currently containing undisturbed vegetation. The overburden volume was measured by Rock Products and the volume included in this report.

The proposed expansion area contains existing access roads with a bordering rabbitbrush ruderal community and two Gambel oak stands. A small sagebrush flat occurs between the two stands but is not part of the area that would be mined. Gambel oak occurs on approximately 4.9 acres in the proposed expansion area.

Vegetation was sampled in the two undisturbed Gambel oak stands using a transect-nested plot method. The vegetation was not sampled in the roadside ruderal community as this represents a disturbed community not typical of the area to be mined. The sagebrush flat was also not sampled quantitatively as no mining will occur within the community. However, all species observed were recorded for the two community types within the proposed Rock Products expansion area and the adjacent sagebrush flats using meandering transects through the habitats.

For a quantitative analysis, three 100 foot transects were randomly located within the oak stands. Two transects were established in stand #1, which will be the first area to be disturbed. One transect was established in stand #2, which will not likely be disturbed for an estimated 5 to 7 years. Ten plots were established along each transect at ten foot intervals for a total of 10 plots/transect or thirty

plots overall. A 0.25 m^2 plot was used to sample the herbaceous and low shrub layer (i.e., all vegetation less than 3.3 feet or 1 meter in height). Per cent vegetation cover was estimated in the 0.25 m^2 plot by overall ground cover, species and life form (monocot, dicot, shrub seedling or sprout). The per cent cover of litter, bare ground and rock was also estimated in the 0.25 m^2 plot. At each sampling point, a 1 m^2 plot was established in which shrub stem cover and density was recorded. The height of the shrub stem nearest the sampling point was also recorded.

Data from all three transects and both stands were combined to calculate the average values for the following parameters in the Gambel oak community: per cent ground covered by vegetation, litter, rock, bare ground; shrub cover, density and mean stem height; mean number of species/plot; species frequency; number of prevalent species.

According to new Summit County guidelines, all development within the county needs to be examined for wetlands. The site was examined for wetlands and two wetland data sheets filled out according to the Army Corps of Engineers (COE) procedures. Vegetation and wetland data were collected on May 29, 2000.

RESULTS

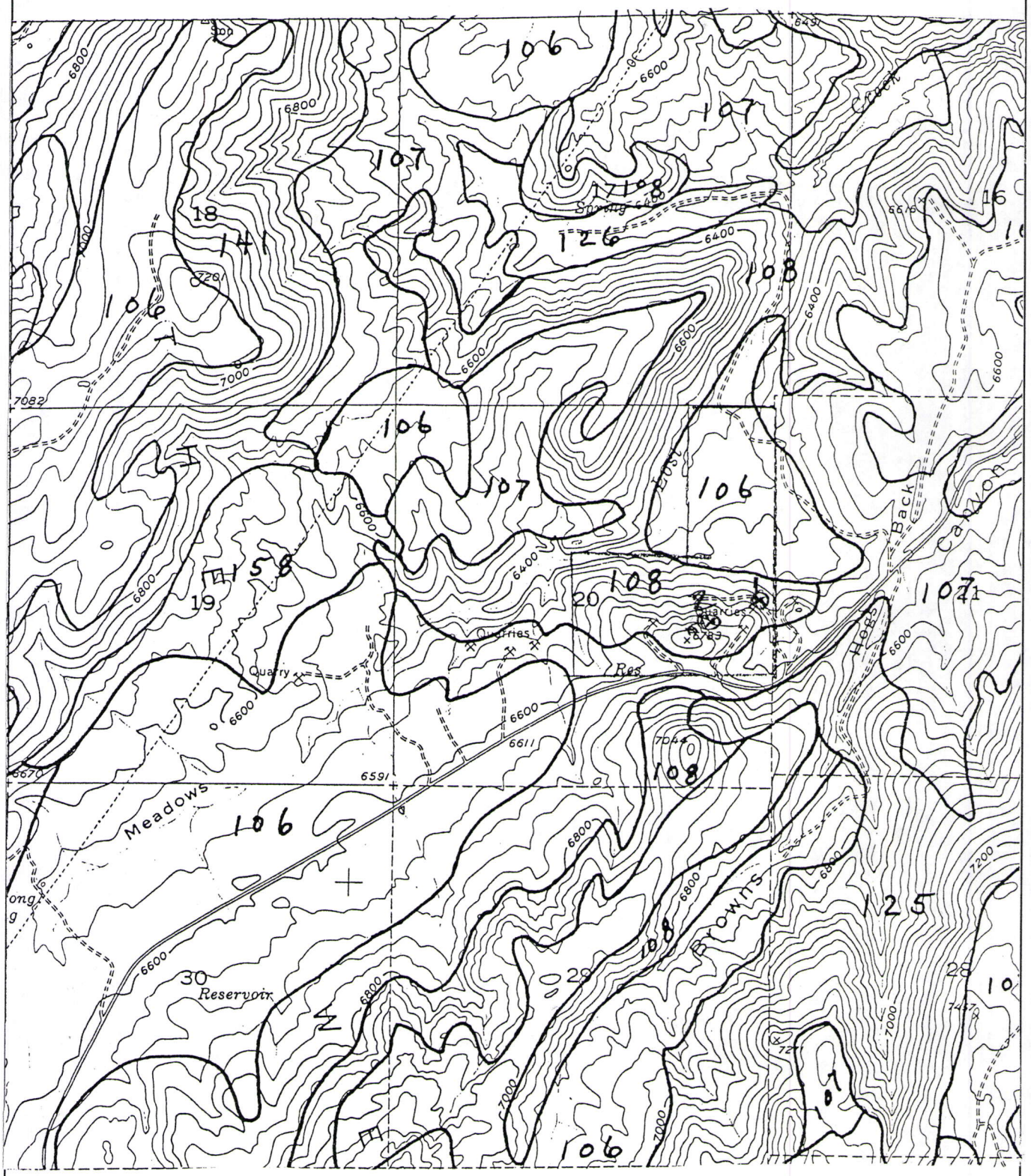
Soils

The NRCS has classified the soils in the proposed expansion area as Ayoub-Dunford-Melling complex, 20 to 60 % slopes (Figure 1 and Appendix A). As observed in the field , the soils are characterized by a relatively shallow and cobbly A horizon with a depth of 12-14 inches. A restrictive layer resembling "caliche" (a cemented clay loam) occurs between 12-24 inches below the soil surface (see Appendix B). Bedrock is shallow and was observed from 24 to 40 inches below the soil surface. This profile most closely matches that of the Dunford component of the series, except that the soil samples on-site showed the A horizon extends to a slightly greater depth (12") than the 10" listed in the draft NRCS "typical profile".

To allow a conservative estimate of the amount of topsoil onsite, the 10 inch depth identified by the NRCS as "typical" for the series was used to calculate the topsoil volume in the undisturbed gambel oak. This amounts to a volume of 6561 cubic yards, with an additional 162 cubic yards of soil available in an existing overburden pile. Using the conservative depth of 10 inches, a total of 6742 cubic yards of topsoil is estimated to be available on-site for site reclamation purposes. If the actual amount of topsoil averages 12-14 inches, as observed in test pits, approximately 8062 cubic yards of topsoil would be available on-site.

Chemical analysis of the topsoil showed that the pH in the undisturbed oak was slightly acid (6.1 [6.5 in the field test]), but slightly alkaline in the overburden (7.9 [8.0 in the field test]). Soils were not saline nor sodic. Organic matter ranged from 4.1 per cent in the undisturbed oak to a low of 0.7 per cent in the overburden. Macronutrient levels were variable, with nitrogen quite low in the overburden matching its low organic matter content. Complete soil results can be found in Appendix C.

Figure 1. NRCS (2000) Soil Map in the Vicinity of the Rock Products Quarry. Soil Sample Locations are Depicted by an "X".



Vegetation

There are no wetlands within the proposed expansion area (see Appendix B).

A total of 31 species were observed in the Gambel oak stands (Table 1) with 22 species sampled quantitatively. Many of the species observed were similar to those observed in studies of other Utah Gambel oak stands (McKell 1950, Ream 1964, Kunzler et al. 1981, Bradley et al. 1992). On average, 2.5 species/0.25m^2 plot were sampled and an average of 0.8 species/m^2 plot in the shrub layer. This is lower than the other studies, possibly reflecting: (1) the higher elevation (6700 ft) and northern exposure of the stands sampled in this report, (2) the shallow depth of topsoil, and (3) the relatively high oak stem height and density and litter.

To determine the number of prevalent species, the average number of species within the nested plots were rounded up to the nearest whole number (3 and 1, respectively) identifying a total of 4 prevalent species. When species were ranked according to frequency, however, several of the top-ranked species had the same frequency of occurrence. In this case, all top-ranked species with the same frequency were considered prevalent. Ranking ties resulted in a total of five species being considered as prevalent in stand #1 and overall.

The most frequently observed species was Gambel oak, occurring in 70% of the shrub plots and 30% of the ground cover plots as vegetative sprouts. The only other species sampled in the shrub layer was serviceberry (*Amelanchier alnifolia*), occurring in 3 of the 30 plots. The most abundant species in the ground cover layer were common bedstraw (*Galium aparine*; 30%), bluebunch wheatgrass (*Elymus spicatum*; 27%), Kentucky bluegrass (*Poa pratensis*;27%) and Oregon grape (*Mahonia repens*; 27%). Comparing the two stands on-site shows that the most abundant grasses, Kentucky bluegrass and bluebunch wheatgrass, are dominant in both stands, but that capitate waterleaf (*Hydrophyllum capitatum*) and common bedstraw were more frequent in stand #1 than stand #2. Neither species occurred in stand #2 where elk sedge (*Carex geyerii*), alcove goldenrod (*Solidago sparsiflora*) and Oregon grape were more common. Prevalent species overall, and by stand are indicated by an * in Table 2.

The average ground cover was 30%. This cover is similar to that reported in McKell (1950) for the Mt. Dell unburned oak stands but is higher than that reported for Pinecrest (13%) and lower than that reported for Parley's Canyon (57%). On average, oak leaf litter provided more ground cover than vegetation (45%) with rock and rock fragments providing 23% of the total ground cover. There was little bare ground. Figure 2 depicts overviews of stands #1 and 2. Figure 2 shows a representative plot within stand #1 demonstrating the low overall vegetative ground cover and the high amount of litter cover.

Table 3. Gambel Oak Stand Parameters at the Rock Products Site.			
Parameter	**Stand #1**	**Stand #2**	**Overall**
Exposure	NNW	NE	northerly
Elevation	6600 ft.	6660 ft.	--
Time Frame for Mining	1-2 years	5-7 years	7-10 years
Depth of Topsoil	12"	14"	12"
Ground Cover			
Total Vegetation Cover < 1m	19	52	30
% Grass cover	11	46	23
% herb cover	4	2	3
% woody species cover in ground layer	4	4	4
% litter	52	33	45.5
% rock	27	15	23
% bare ground	2	<1	1.5
Shrub layer			
% aerial cover	30	23	25
Stem density/m2	3	1.4	1.8
stem ht (cm)	154	288	189
Species Diversity			
Ground cover	2.7	2.6	2.5
Shrub layer	0.9	0.6	0.8
Total stand	3.3	3.1	2.9

Table 1. Plant Species Observed at the Rock Products Site.			
Shrubs			
	Gambel Oak	**Existing Roadside Ruderal**	**Sagebrush[1]**
Amelanchier alnifolia	x		x
Artemesia tridentata	x	x	x
Cercocarpus montanus			x
Chrysothamnus nauseosus	x	x	
Chrysothamnus viscidiflorus		x	
Lonicera tartarica		x	x
Mahonia repens	x		
Pachystima myrsinites	x		
Physcocarpos malvaceous	x		
Prunus virginiana	x		
Quercus gambelii	x		
Rosa woodsii	x		x
Symphoricarpos oreophilus	x		
Herbaceous Species			
Monocots			
Agropyron cristatum	x		x
Bromus carinatus	x		x
Bromus japonicus	x	x	
Bromus tectorum	x	x	x

Table 1 (cont.)			
	Gambel Oak	**Existing Roadside Ruderal**	**Sagebrush[1]**
Carex geyerii	x		x
Carex hoodii	x		x
Elymus spicatum	x		x
Poa annua	x	x	
Poa bulbosa		x	
Poa pratensis	x	x	x
Melica bulbosa	x		x
Dicots			
Achillea millefolium			x
Agoseris glauca			x
Artemesia ludoviciana			x
Cirsium arvense		x	
Cirsium vulgare		x	
Cirsium undulatum	x		
Collomia spp.	x		
Erigeron sp.			x
Erodium circinatum		x	
Galium aparine	x		
Grindelia squarrosa			x
Hydrophyllum capitatum	x		
Lathyrus pauciflorus	x		
Lupinus spp.			x

Table 1 (cont.)			
	Gambel Oak	**Existing Roadside Ruderal**	**Sagebrush[1]**
Medicago lupilina	x	x	
Medicago sativa		x	
Phlox longifolia			x
Ranunculus testiculatus		x	
Senecio integerrimus	x		x
Solidago sparsiflora	x		
Stellaria jamesiana	x		
Vicia americana	x		x
Vigiuera multiflora	x		x
Tot. # species	31	15	23

[1] Sagebrush area between two gambel oak stands will not be disturbed by mining

Table 2. Frequency of Plant Species Within the Natural Vegetation Area (Gambel Oak) to be Disturbed at the Rock Products Site. Prevalent species with each stand and overall are indicated by an asterisk (*).			
SHRUB LAYER (1.0 m2 plot; woody vegetation > 1m in height)			
	Stand #1	**Stand #2**	**Overall**
Amelanchier alnifolia	.15	0	.10
Quercus gambelii	.80*	.60*	.70*
HERB LAYER (0.25m2 plot; all vegetation < 1m in height)			
Monocots			
Agropyron cristatum	.05	.10	.07
Bromus japonicus	.10	0	.07
Bromus tectorum	.10	0	.07
Carex geyerii	0	.50*	.17
Carex hoodii	0	.10	.03
Elymus spicatum	.30*	.20	.27*
Poa annua	0	.10	.03
Poa pratensis	.25*	.20	.27*
Melica bulbosa	.05	.20	.10
Dicots			
Galium aparine	.45*	0	.30*
Hydrophyllum capitatum	.25*	0	.17
Lathyrus pauciflorus	0	.10	.03
Medicago lupilina	.10	0	.07
Senecio integerrimus	.10	0	.07
Solidago sparsiflora	0	.33*	.10
Stellaria jamesiana	.05	0	.03

Table 2 (cont.)			
	Stand #1	**Stand #2**	**Overall**
Vigiuera multiflora	.05	0	.03
Shrub seedlings/sprouts < 1m in height			
Amelanchier alnifolia	.05	0	.03
Artemesia tridentata	.20	0	.07
Mahonia repens	.15	.40*	.27*
Physocarpos malvaceous	0	.10	.03
Quercus gambelii	.45	.20	.30
# Prevalent Species	5	4	5

Figure 2. Overview of stand #1 looking at it from the base of stand #2 in a due east direction(top) and stand #2 looking at it from the existing access road in a due west direction (bottom). Photograph taken 5/29/00.

Figure 3. Close-up view of vegetation in 0.25m2 plot in stand #1. Photograph taken 5/29/00.

REFERENCES

Bradley, A.F., N.V. Noste and W.C. Fischer. 1992. Fire Ecology of Forests and Woodlands in Utah. US Forest Service Intermountain Research Station. Gen Tech Rep INT-287.

Kunzler, L.M., K.T. Harper and D.B. Kunzler. 1981. Compositional similarity within the oakbrush type in central and northern Utah. Great Basin Naturalist 41(1):147-153.

McKell, C.M. 1950. A study of plant succession in the oak brush (*Quercus gambelii*) zone after fire. University of Utah unpublished thesis, Salt Lake City, UT.

Ream, R.R. 1964 The vegetation of the Wasatch Mountains, Utah and Idaho. University of Wisconsin unpublished dissertation, Madison, WI.

APPENDIX A

NRCS SOIL PROFILE DATA

107—**Ayoub-Dunford-Melling complex, 15 to 30 percent slopes**.
Ayoub, about 40 percent, is a moderately deep, well drained, moderately slowly permeable soil on mountain slopes under sagebrush and grasses. Typically it is slightly acid cobbly loam about 6 inches thick over slightly acid to neutral gravelly clay loam about 17 inches thick over neutral very cobbly loam over andesite bedrock at 20 to 40 inches. Precipitation is 16 to 22 inches, frost-free period is 60 to 90 days, and capability rating is 6e nonirrigated.
Dunford, about 20 percent, is a moderately deep, well drained, moderately slowly permeable soil on mountain slopes under oak brush. Typically it is neutral cobbly loam about 10 inches thick over gravelly clay loam over andesite bedrock at 20 to 40 inches. Precipitation is 16 to 22 inches, frost-free period is 60 to 90 days, and capability rating is 6e nonirrigated.
Melling, about 20 percent, is a shallow, well drained, moderately slowly permeable soil on mountain slopes under sagebrush and grasses. Typically it is neutral extremely stony loam over very cobbly clay loam over andesite bedrock at 10 to 20 inches. Precipitation is 16 to 22 inches, frost-free period is 60 to 90 days, and capability rating is 7s nonirrigated.

108—**Ayoub-Dunford-Melling complex, 30 to 60 percent slopes**.
Ayoub, about 40 percent, is a moderately deep, well drained, moderately slowly permeable soil on mountain slopes under sagebrush and grasses. Typically it is slightly acid cobbly loam about 6 inches thick over slightly acid to neutral gravelly clay loam about 17 inches thick over neutral very cobbly loam over andesite bedrock at 20 to 40 inches. Precipitation is 16 to 22 inches, frost-free period is 60 to 90 days, and capability rating is 7e nonirrigated.
Dunford, about 20 percent, is a moderately deep, well drained, moderately slowly permeable soil on mountain slopes under oak brush. Typically it is neutral cobbly loam about 10 inches thick over gravelly clay loam over andesite bedrock at 20 to 40 inches. Precipitation is 16 to 22 inches, frost-free period is 60 to 90 days, and capability rating is 7e nonirrigated.
Melling, about 20 percent, is a shallow, well drained, moderately slowly permeable soil on mountain slopes under sagebrush and grasses. Typically it is neutral extremely stony loam over very cobbly clay loam over andesite bedrock at 10 to 20 inches. Precipitation is 16 to 22 inches, frost-free period is 60 to 90 days, and capability rating is 7e nonirrigated.

109—**Cluff loam, 8 to 30 percent slopes,** is a deep, well drained, slowly permeable soil on mountain slopes under mixed conifer. Typically it is slightly acid loam over gravelly loam about 9 inches thick over very gravelly loam about 7 inches thick over very cobbly clay loam about 4 inches thick over very cobbly clay over conglomerate bedrock at 40 to 60 inches. Precipitation is 22 to 35 inches, frost-free period is 20 to 60 days, and capability rating is 6e nonirrigated.

110—**Cluff loam, 30 to 60 percent slopes**, is a deep, well drained, slowly permeable soil on mountain slopes under mixed conifer. Typically it is slightly acid loam over gravelly loam about 9 inches thick over very gravelly loam about 7 inches thick over very cobbly clay loam about 4 inches thick over very cobbly clay over conglomerate bedrock at 40 to 60 inches. Precipitation is 22 to 35 inches, frost-free period is 20 to 60 days, and capability rating is 7e nonirrigated.

111—**Crandall gravelly loam, 2 to 8 percent slopes**, is a deep, well drained, moderately slowly permeable soil on mountain slopes under grasses and forbs. Typically it is neutral gravelly loam about 14 inches thick over very cobbly clay loam over slightly alkaline very cobbly loam over conglomerate bedrock at 40 to 60 inches. Precipitation is 22 to 35 inches, frost-free period is 20 to 60 days, and capability rating is 6s nonirrigated.

Contrasting

Echocreek and similar soils
Composition: 0 to 5 percent
Landform: Stream terrace
Typical vegetation: basin ~~big sagebrush~~ wild Rye
Ecological site: 047~~AY308~~UT--Upland Loam (basin ~~Big Sagebrush~~) Wild Rye
XA 310

Fewkes and similar soils
Composition: 0 to 5 percent
Landform: Mountain slope
Typical vegetation: slender wheatgrass, bluebunch wheatgrass, needlegrass, mountain big sagebrush
Ecological site: 047~~AY~~430UT--Mountain Loam (mountain Big Sagebrush)
XA

Hades and similar soils
Composition: 0 to 5 percent
Landform: Mountain slope
Typical vegetation: slender wheatgrass, ~~bluebunch wheatgrass, needlegrass~~, Gambel oak, mountain snowberry
Ecological site: 047~~AY~~432UT--Mountain Loam (oak)
XA

Rock Outcrop
Composition: 0 to 5 percent
Landform: Escarpment, ridge
Ecological site: None assigned

Management

For information about managing this map unit, see the following sections and associated tables in Part II of this publication:
"Range" section
"Agronomy" section
"Recreation" section
"Wildlife Habitat" section
"Engineering" and "Soil Properties" sections

108--Ayoub-Dunford-Melling Complex, 30 To 60 Percent Slopes

Map Unit Setting

MLRA:
~~Landscape: None assigned~~
Elevation: 5805 to 7805 feet 5800 - 7800
Precipitation: ~~14 to 23~~ inches 16 - 22
Air temperature: ~~39~~ to 45 degrees Fahrenheit 40
Frost-free period: 60 to ~~100~~ days 90

Composition

Ayoub cobbly loam, 30 to 60 percent slopes--40 percent
Dunford cobbly loam, 30 to 60 percent slopes--20 percent
Melling extremely stony loam, 30 to 60 percent slopes--20 percent
Fewkes gravelly loam, 30 to 60 percent slopes--5 percent
Echocreek loam, 2 to 10 percent slopes--5 percent
Hades loam, 30 to 60 percent slopes--5 percent
Rock Outcrop , ~~to percent slopes~~--5 percent

Component Description

Ayoub and similar soils
Landform: Mountain slope
Parent material: Colluvium derived from andesite
Typical vegetation: slender wheatgrass, bluebunch wheatgrass, ~~Letterman~~ needlegrass, mountain big sagebrush

Typical profile:
A--0 to 6 inches; cobbly loam
Bt1--6 to 12 inches; gravelly clay loam
Bt2--12 to 18 inches; gravelly clay loam
Bt3--18 to 23 inches; gravelly clay loam
C--23 to 35 inches; very cobbly loam
R--35 to 35 inches; bedrock

See "Chemical Properties of Soils" table and the "Physical Properties of Soils" table for more information.

Component Properties and Qualities south
Slope: 30 to 60 percent , ~~northeast~~ to ~~northwest~~ aspects
Runoff: Very high
Depth to Restrictive Feature: Bedrock (lithic): 20 to 40 inches
Available water capacity: About 4 inches
Present flooding: None
Natural drainage class: Well drained

Interpretive Groups
Nonirrigated land capability: 7e
Ecological site: 047XY406UT--Mountain Gravelly Loam (mountain Big Sagebrush)

Component Description

Dunford and similar soils
Landform: Mountain slope
Parent material: Colluvium derived from andesite
Typical vegetation: slender wheatgrass, bluebunch wheatgrass, mountain brome, Gambel oak

Typical profile:
A--0 to 10 inches; cobbly loam
Bt1--10 to 21 inches; gravelly clay loam
Bt2--21 to 36 inches; gravelly clay loam
R--36 to 36 inches; bedrock

See "Chemical Properties of Soils" table and the "Physical Properties of Soils" table for more information.

Component Properties and Qualities south
Slope: 30 to 60 percent , ~~northeast~~ to ~~northwest~~ aspects
Runoff: Very high
Depth to Restrictive Feature: Bedrock (lithic): 20 to 40 inches
Available water capacity: About 4 inches
Present flooding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e
Ecological site: 047AY410UT--Mountain Gravelly Loam (oak)

Component Description

Melling and similar soils
Landform: Mountain slope
Parent material: Colluvium derived from andesite
Typical vegetation: bluebunch wheatgrass, ~~Idaho fescue~~, mountain big sagebrush, ~~antelope bitterbrush~~

Typical profile:
A--0 to 6 inches; extremely stony loam
Bt--6 to 19 inches; very cobbly clay loam
R--19 to 19 inches; bedrock

See "Chemical Properties of Soils" table and the "Physical Properties of Soils" table for more information.

Component Properties and Qualities
Slope: 30 to 60 percent , ~~northeast~~ south to ~~northwest~~ aspects
Runoff: Very high
Depth to Restrictive Feature: Bedrock (lithic): 12 to 20 inches
Available water capacity: About 1.5 inches
Present flooding: --- None
Natural drainage class: Well drained

Interpretive Groups
Nonirrigated land capability: 7e
Ecological site: 047AY446UT--Mountain Shallow Loam (mountain Big Sagebrush)
XA

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Echocreek and similar soils
Composition: 0 to 5 percent
Landform: Stream terrace
Typical vegetation: basin ~~big sagebrush~~ wild rye
Ecological site: 047A~~Y308UT--Upland Loam (basin Big Sagebrush)~~ wild rye
XA310

Fewkes and similar soils
Composition: 0 to 5 percent
Landform: Mountain slope
Typical vegetation: slender wheatgrass, bluebunch wheatgrass, needlegrass, mountain big sagebrush
Ecological site: 047AY430UT--Mountain Loam (mountain Big Sagebrush)
XA

Hades and similar soils
Composition: 0 to 5 percent
Landform: Mountain slope
Typical vegetation: slender wheatgrass, ~~bluebunch~~ bluebunch wheatgrass needlegrass, Gambel oak, snowberry
Ecological site: 047AY432UT--Mountain Loam (oak)
XA

Rock Outcrop

APPENDIX B

COE DATA SHEETS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Rock Products of Utah Applicant/Owner:Devlin Wurtz Investigator:Leslie Gecy	Date:5/29/00 County Summit State:Utah
Do Normal Circumstances Exist on the site? Yes Is the site significantly disturbed (Atypical Situation) No Is the area a potential problem area? No (If needed, explain on reverse)	Community ID:Gambel oak Transect ID:_____ Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Quercus gambelii	S 35%	UPL	9.		
2. Artemisia repens	H 30%	UPL	10.		
3. Carex aperine	H 2%	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-). 0

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photographs
- ___ Other

X No recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: >24 (in.)

Depth to Saturated Soils: >24 (in.)

Wetland Hydrology Indicators:

Primary Indicators: None
- ___ Inundated
- ___ Saturated in Upper 12 inches hydrology data from 4/12 & 5/29
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators:
- ___ Oxidized Root Channels in upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Ayoub-Dunford-Melling comples, 30-60% slopes

Drainage Class: Well

Taxonomy (Subgroup): superactive frigid Typic Argixerolls,superactive frigid Pachic Argixerolls,superactive frigid LthicArgixeroll

Field Observations
Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	5YR 2.5/1	none		gravelly cobbly loam
12-24	B	10YR 8/2	-		gravelly clay loam
24+	C	none - soil auger refusal			very cobbly loam

Hydric Soil Indicators: none

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other)explain in remarks)

Remarks: Mathis Dunford component;

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	(Circle)	Circle
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)		Is this sampling point within a wetland? Yes (No)

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Rock Products of Utah Applicant/Owner:Devlin Wurtz Investigator:Leslie Gecy	Date:5/29/00 County Summit State:Utah
Do Normal Circumstances Exist on the site? Yes Is the site significantly disturbed (Atypical Situation) No Is the area a potential problem area? No (If needed, explain on reverse)	Community ID:Gambel oak Transect ID: Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Quercus gambelli	S 20%	UPL	9.		
2. NA pratt rose	H 7%	FACU	10.		
3. Hydrophyllum	H 3%	UPL	11.		
4. capitatum			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-). 0

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photographs
- ___ Other

X No recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: 740 (in.)

Depth to Saturated Soils: 740 (in.)

Wetland Hydrology Indicators: hydrology data from 4/12 + 5/29

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

None

Secondary Indicators:
- ___ Oxidized Root Channels in upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): Ayoub-Dunford-Melling comples, 30-60% slopes

Drainage Class: Well

Taxonomy (Subgroup): superactive frigid Typic Argixerolls,superactive frigid Pachic Argixerolls,superactive frigid LthicArgixeroll

Field Observations
Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	5 YR 2.5/1	none	+	cobbly loam
12-24	B_1	"	"		gravelly clay loam
24-40	B_2	10YR 6/2			clay loam
40+	R Bedrock				

Hydric Soil Indicators: none

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other)explain in remarks)

Remarks: at an exposed cut; matches Dunford component

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	(No)	(Circle)
Wetland Hydrology Present?	Yes	~~No~~	
Hydric Soils Present?	Yes	(No)	

Is this sampling point within a wetland? Yes (No) (Circle)

Remarks:

Approved by HQUSACE 3/92

APPENDIX C

SOIL CHEMISTRY DATA

Soil Test Report

and

Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 4/17/00
Date Completed: 5/2/00

Name: WESTERN WETLAND SYSTEMS
Address:
1625 PALOMINO CIRCLE
HEBER UT 84032

County: WASATCH

Lab Number: 00010716
Identification: 1 OVERBURDEN
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	+	Normal	
pH	7.9	Normal	
Salinity - ECe mmhos/cm	0.3		
Phosphorus - P ppm	5.2		35-55 lbs P2O5/A
Potassium - K ppm	80		80-120 lbs K2O/A
Nitrate-Nitrogen - N ppm			40-60 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	1.95	Soil Not Sodic	
Organic Matter %	0.7		

Notes
KJELDAHL NITROGEN = 0.02%
CATION EXCHANGE CAPACITY = 9.6 meq/100g

For further assistance, please see your County Agent -- Val Warnick - 654-3211 ext.322

Soil Test Report

and

Fertilizer Recommendations

USU Analytical Labs

Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 4/17/00
Date Completed: 5/2/00

Name: WESTERN WETLAND SYSTEMS
Address:
1625 PALOMINO CIRCLE
HEBER UT 84032

County: WASATCH

Lab Number: 00010717
Identification: 2 UNDISTURBED OAK
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Loam		
Lime	0	Low	
pH	6.1	Low	
Salinity - ECe mmhos/cm	0.3		
Phosphorus - P ppm	2.4		50-70 lbs P2O5/A
Potassium - K ppm	185		0 lbs K2O/A
Nitrate-Nitrogen - N ppm			40-60 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	1.06	Soil Not Sodic	
Organic Matter %	4.1		

Notes
KJELDAHL NITROGEN = 0.15%
CATION EXCHANGE CAPACITY = 15.0 meq/100g

For further assistance, please see your County Agent -- Val Warnick - 654-3211 ext.322

This page is a reference page used to track documents internally for the Division of Oil, Gas and Mining

Mine Permit Number M0430017 Mine Name Browns Cyn Rock Product
Operator Rock Products of UT Date 8-21-2000
TO _____ FROM _____

__CONFIDENTIAL __BOND CLOSURE __LARGE MAPS __EXPANDABLE
__MULTIPUL DOCUMENT TRACKING SHEET __NEW APPROVED NOI
__AMENDMENT _OTHER Binder

Description YEAR-Record Number

X NOI __Incoming __Outgoing __Internal __Superceded

___NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__TEXT/ 81/2 X 11 MAP PAGES __11 X 17 MAPS __LARGE MAP

COMMENTS: _____

CC: _____